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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Kunio Shimizu et al.

Examiner: U.K. Rajguru

Serial No.: 10/004,385

Art Unit: 1711

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Title: Protective Film of a Polarizing Plate

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

DECLARATION UNDER 37 CFR § 1.132

Dear Examiner Rajguru:

Attached you will find a declaration filed under 37 CFR § 1.132 consisting of 9 pages.

Date: 1/6/04

Respectfully submitted,

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Experiment

The following experiments were carried out by Mr. Kunio Shimizu, one of the inventor of the present application.

The purpose of the present experiments is to demonstrate that the reference JP 07020317 does not disclose the keeping condition of the present claim. Another purpose of the present experiments is to demonstrate that the samples disclosed in the reference JP 07020317 have inferior properties when used for a protective film of a polarizing plate compared with the samples of the present invention.

Kunio Shimizu:

I am a post graduate from Hokkaido University having been awarded a Masters Degree in Technology in March 1980.

Since April 1986, I have been employed by Konica Corporation, the owner of the above-identified application.

During my employment, I have been engaged in the research and the study of polarizing plate materials in the Research and Development Laboratories of Konica Corporation.

Preparation of Film Samples 1 and 2

Film Samples 1 and 2 were each prepared in accordance with the preparation method disclosed in JP 07020317.

Film Sample 1:

The following dope composition was used to prepare Film Sample 1.

Dope composition 1:

Triacetyl cellulose (acetic acid content: 61.0%)	100 parts by weight
TPP (triphenyl phosphate)	15 parts by weight
Methylene chloride	360 parts by weight
Methanol	40 parts by weight
1-Butanol	20 parts by weight

The above-mentioned dope composition 1 was charged in a closed vessel, heated, and cellulose triacetate (TAC) was completely dissolved with stirring to obtain a dope. The dope was introduced to a film making apparatus which contained a dope casting portion and a drum.

Then the dope was cast on the drum. The cast film was peeled and, then transported to a heating apparatus (at 100 °C) having a plurality of rolls so as to dry the film. The obtained TAC film has a thickness of 80 μm. The same film

was again transported to the heating apparatus and heated to 150 °C for 10 minutes in order to evaporate the plasticizer which remained on the surface of the film to yield Film Sample 1.

Film Sample 2:

The following dope composition was used to prepare Film Sample 2.

Dope composition 2:

Triacetyl cellulose (acetic acid content: 61.0%)	100 parts by weight
TPP (triphenyl phosphate)	22 parts by weight
Methylene chloride	360 parts by weight
Methanol	40 parts by weight
1-Butanol	20 parts by weight

The above-mentioned dope composition 2 was charged in a closed vessel, heated, and cellulose triacetate (TAC) was completely dissolved with stirring to obtain a dope. The dope was introduced to a film making apparatus which contained a dope casting portion and a drum.

Then the dope was cast on the drum. The cast film was peeled and, then transported to a heating apparatus (at 100

°C) having a plurality of rolls so as to dry the film. The obtained TAC film has a thickness of 80 μm. The same film was again transported to the heating apparatus and heated to 150 °C for 15 minutes in order to evaporate the plasticizer which remained on the surface of the film to yield Film Sample 2.

Preparation of Polarizing Plates Samples 1 and 2:

The thus prepared Film Sample 1 and 2 were each subjected to an alkaline treatment in a 2.5 mol/l aqueous solution of sodium hydroxide at 40° C for 60 sec., and washed with water for 3 min. to form a saponified layer to prepare alkali-treated films 1 and 2.

Next, a polyvinyl alcohol film was immersed in 100 part by weight of an aqueous solution containing 1 part by weight of iodine and 4 parts by weight of boric acid, and was stretched up to 4 times at 50 °C to obtain a polarizer film. Polarizing plate samples Nos. 1 and 2 was prepared by laminating the foregoing alkali-treated film onto both surfaces of the polarizer film using an aqueous 5% completely saponified polyvinyl alcohol as an adhesive.

Evaluation method:

<Evaluation of Retainability>

(1) Samples were cut to a size of 10 cm x 10 cm, then, the weight was measured after being allowed to stand in an atmosphere of 23° C and 55% RH for 24 hrs., and then the samples were further allowed to stand in an atmosphere of 140° C for 10 min. Thereafter, the weight was measured after the samples were further allowed to stand under an atmosphere of 23° C and 55% RH for 24 hrs. and retainability was calculated in the following manner:

Retainability (weight%) ={[(weight before allowed to stand) - (weight after allowed to stand)]/(weight before allowed to stand} x 100.

(2) Samples were cut to a size of 10 cm x 10 cm, then, their weights were measured after being allowed to stand in an atmosphere of 23 °C and 55% RH for 24 hrs. and they were further allowed to stand in an atmosphere of 80°C and 90% RH for 48 hrs. Then, the surface of each sample was wiped slightly and after further allowed to stand at 23 °C and 55% RH for one day, the weight was measured to calculate retainability in the following manner:

Retainability (weight%) ={[(weight before allowed to stand) - (weight after allowed to stand)]/(weight before allowed to stand} x 100.

<Measurement of Moisture Permeability>

Moisture permeability of each sample was measured according to the method described in JIS Z 0208.

<Dimensional Stability>

Cross patterns were marked at two points (MD and longitudinal directions) on the surface of film samples, and samples were subjected to a thermal treatment (at 80° C, 90% RH, 50 hrs.), after which the distance between the marks was measured by an optical microscope.

Dimensional stability was determined according to the following equation, where a_1 is the distance before being subjected to the thermal treatment and a_2 is the distance after being subjected to the thermal treatment:

Dimensional stability (%) = $[(a_1-a_2)/a_1] \times 100$

<Durability Test of Polarizing Plate>

Two sheets of 10 cm x 10 cm polarizing plate sample

were subjected to a thermal treatment (at 80 °C, 90% RH, for 50 hrs.), and the length of a white border portion around the longer center line in the longitudinal or transverse directions, when the two sheets were superposed at a right angle, was measured to determine the levels as described below. The white border portion means the state that light passes through at a border part of a polarizing plate where light should essentially not pass through when two polarizing plates were placed at a right angle to each other, and it can be visually judged. In a polarizing plate, this causes a defect which makes the displayed image at the border invisible. The results of evaluation according to the following criteria are shown in Table 1.

A: the white border portion is less than 5% (a level causing no problem as a polarizing plate),

B: the white border portion is not less than 5% and less than 10% (a level causing no problem as a polarizing plate),

C: the white border portion is not less than 10% and less than 20% (a level barely usable as a polarizing plate),

D: the white border portion is not less than 20% and less than 50% (a level causing a problem as a

polarizing plate),

E: the white border portion is not less than 50% (a level not usable as a polarizing plate).

Rank C and better ranks are levels acceptable for practical use.

The evaluation results are shown in Table 1. These results demonstrate that cellulose ester films disclosed in the reference JA 0720317 have an inferior property both in Retainability of Film Sample and Durability of Polarizing Plate compared to that of the present invention.

As is shown in Table 1, the cellulose ester film samples of JP 07020317 failed to achieve the required properties of the present invention.

Table 1

Film Sample No.	Preparation Method (JP-A 7-20317)	Additive	Film thickness (μm)	Retainability (weight %)		Moisture Permeability $g/m^2 \cdot 24hr$	Dimentional Stability (%)		Durability of Polarizing Plate
				140°C, 10 min.	80°C, 90% 48hr		Longitudinal Direction	Lateral Direction	
1	Example 1	TPP	80	0.8	3.9	280	-1.06	-0.03	D
2	Example 2	TPP	80	1.0	4.5	270	-0.98	-0.05	D